



Science News-Letter

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PSYCHOLOGY

New Ideas on Clothing Advanced by Psychologist

By EMILY C. DAVIS

Why are so many women wearing short skirts? Why do so many other women object violently to short skirts? And why do human beings wear clothes at all, anyway?

These difficult questions have at last been answered by a well known psychologist, Dr. Knight Dunlap, professor of psychology at Johns Hopkins University, who has just reported new theories on clothing to the *Journal of General Psychology*.

Dr. Dunlap ignores the usual superficial idea that styles are made in Paris. Master minds working in mysterious sanctums of fashion may invent novelties of costume, but the psychologist goes deeper into the subject and shows how our fashions in dress become established according to a few simple principles of human nature.

Clothes, it seems, are designed

sometimes to set off personal attractiveness and sometimes to conceal personal defects. Modern dresses, knee length, often sleeveless, are fine examples of the type of style that gives a well formed girl a chance to show off her good points, while the billowing, trailing skirts of the Victorian era are the concealing type of style that is kind to knock-knees and thick ankles. So far as men are concerned, knee breeches and silk stockings once played up shapely legs for men fortunate enough to possess them, whereas since Colonial days stovepipe trousers, representing the concealing type of garment, have encased masculine legs good and bad alike for more than a century.

Which kind of clothes happens to be seen on the streets in any decade depends on the strength of the forces that favor personal display or person-

al concealment. And the struggle for the balance of power, Dr. Dunlap shows, is one of the keenest and most remarkable contests in the human drama.

Men and women, seeking to make themselves attractive to the opposite sex, must always measure up as best they can to standards of what is considered beautiful and desirable. The standards of African natives are not those of the Chinese, nor the American, but for practical purposes they may be reduced to the following items, Dr. Dunlap concludes:

The points, chiefly points of beauty, by which a man judges women are: Form and proportion of body; coloration of skin, hair, and eyes; nutrition and general health; coordination in movement and posture; and certain minor factors such as texture of hair

(Just turn the page)



THESE STYLES have been fought over: (left to right)—1. 15th century—extravagant headdresses bitterly denounced. 2. 16th century—the huge, bell-shaped farthingale shocked Elizabeth's court. 3. 17th century—V-shaped necks alarmed the clergy. 4. 18th century—Greek style and very little of that—more alarm. 5. 19th century—wasp waists and dust trailers were declared ruinous to health. 6, 7, 8. 20th century. From hobble skirt to backless gown to knee length skirt, endless criticism.

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New Ideas of Clothing

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and skin, form of eye, mouth, and other features, quality of voice, and temperament.

The standards of attractiveness by which women judge men are: Stature above the average; muscular development for both strength and agility; lung development for endurance; racially normal features; thick hair, preferably curly; and aggressiveness and economic ability.

Considering each item, it is easily seen that few people rank high by these standards. Consequently, in the competition for the attention of the opposite sex clothes play a strategic role by accenting charm or concealing the lack of it.

In past centuries, kings and queens were powerful enough in the fashionable world to set the styles to fit their own personal peculiarities. When Marie Antoinette stuck two tall peacock feathers in her hair and found the exotic effect becoming to her, feathers immediately became the last touch to every fashionable headdress in the French court. It is said that Catherine the Great made the carrying of handkerchiefs popular because her defective teeth were less noticeable when she held a kerchief before her face. And because Henry IV of France had gray hair the courtiers tactfully powdered their brown or golden hair and liked it, or pretended they did.

But this privilege of royalty to steer the fashions has been practically lost since fashions began to be followed by all ranks instead of by people of wealth and leisure alone. Nowadays, whether styles are to be of the revealing type, as in the present epoch of the knee length skirt, or of the concealing type, as in the days of the crinoline, depends on a delicate balance of power among men and women in general, Dr. Dunlap shows.

Taking the much discussed item of legs, he points out that we can readily

satisfy ourselves at any bathing beach that only a small percentage of legs for either sex are presentable.

"A few years ago, competition in women's legs was non-existent, except for positions on the stage," he says. "Now it is open and impressive. If the possessors of the more shapely legs expose them, those afflicted with the more unfortunate limbs must expose them also, or else be suspected of being more unfortunate than perhaps they really are.

"It is no accident that the opening up of this competition has been fought every inch of the way by certain types of women as well as by moralist males. The competition has been forced, however, by the group of women who have been confident that they would not suffer in open comparison, and the others have fallen resentfully in line. The powers urging a return to longer and more voluminous skirts are not made up exclusively of cotton and wool growers and manufacturers."

While the battle of the skirts has been won by the faction of women in favor of freedom of the knees, there has been a concession made to less attractive women by covering up facial defects.

"It is a noteworthy fact," Dr. Dunlap declares, "that as the competition in figures opened up, women began to cover their faces with masks of paint and powder, so that the earlier specific significance of the term 'painted woman' was completely lost. It would seem that as one union rule in restraint of competition was broken down another compensating restriction was set up. A mask, like other disguises, reduces competitors to a more equal basis. The advantages of the fresh and blooming complexion as compared with the fallow, spotted, and leathery maps of older or less favored females, are lost when all are hidden by the enameling and calcining process. It is possible that the proponents of the short and skimpy

(Turn to page 73)



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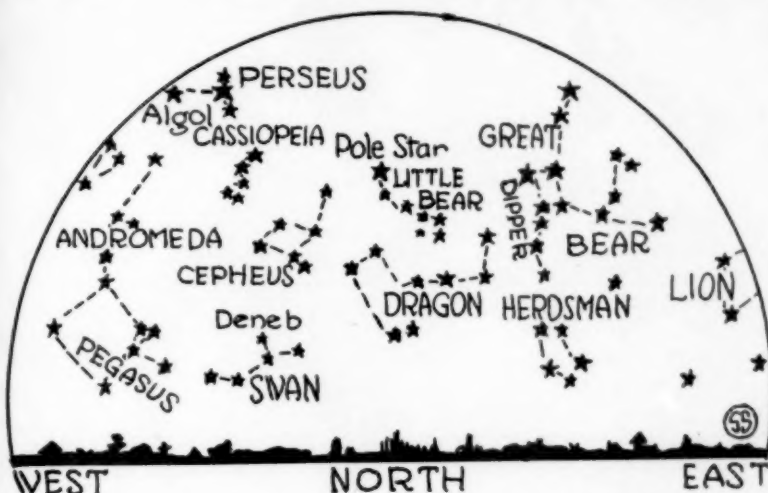
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Recent Years Bring Record Comet Discoveries



By JAMES STOKLEY

One of the most remarkable things about the last two years has been the great number of comets that have visited the earth, two of which have become bright enough to be seen with the naked eye. During 1927 ten such visitors came, while in 1926 eleven were discovered. Perhaps this is due to the fact that more careful watch is being kept for them, or perhaps they are more numerous now than they have been in the past.

The most recent of these visitors was the Skjellerup comet, which an Australian amateur astronomer, J. F. Skjellerup, picked up on December 3. Though this comet did not come into the northern sky, as expected, it did become bright enough to be seen in the daytime when near the sun—unusually bright for a comet.

As several others of this flock of comets were discovered by amateur astronomers, it is evident that this is one thing that does not require the facilities of a great observatory. However, the Yerkes Observatory, of the University of Chicago, and the Observatory of the University of Heidelberg, Germany, also picked up some of these visitors. But a comet, especially a new one, may turn up at the most unexpected times. Even an old one, a periodic comet that returns again and again, may sometimes be perturbed, and come back some distance away from the place where it was expected to appear. And, again, as has happened in the past, an expected comet may fail to appear at all.

This all indicates that cometary discoveries are largely a matter of good luck.

Great Comet Chaser

One of the first of the great comet chasers was a Frenchman by the name of Messier who lived in the Eighteenth Century. It is curious that the thing for which his name is today best remembered he probably regarded as a nuisance.

Scattered throughout the sky are numerous nebulae. These appear in a telescope as faint patches of light. When a comet is first discovered, it rarely has a tail, and so it, too, looks like a faint patch of light. So much does it resemble a nebula that the only way of determining its nature is to watch it for a while. The comets are moving among the stars, but not the nebulae. So if a faint patch of light is picked up in the telescope, and it is seen to move, then the astronomer knows that he has a comet.

As the comets may be moving rather slowly, however, it would be rather annoying to an enthusiastic

comet hunter to pick up what is supposedly a new comet, and then, after many hours to find that it isn't moving, and so is a nebula after all. Messier, to save this trouble, proceeded to prepare a catalog of the most conspicuous nebulae, so that he could recognize them instantly. This was the first such catalog and so, even today, they are frequently referred to as Messier 33, or Messier 51, according to their number in his list.

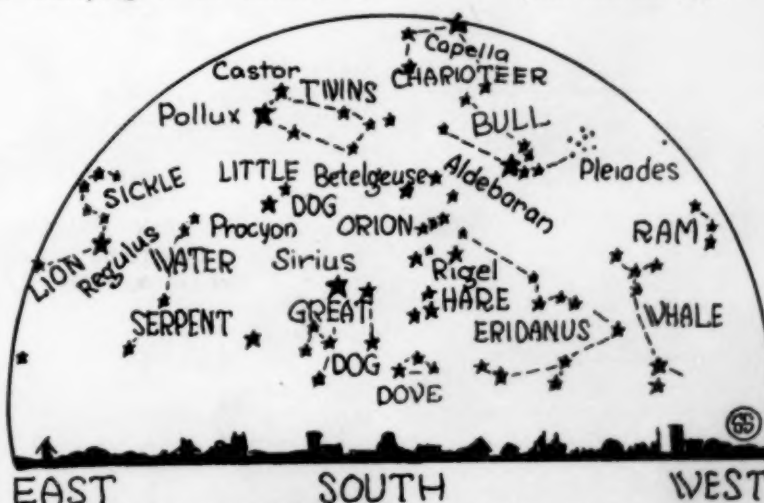
Modern Binoculars Better

Messier's telescope had a lens only two and a half inches in diameter, was only two feet long, and only magnified five diameters. A good pair of modern prism binoculars would be far superior to this instrument in every way. But with its aid he discovered thirteen comets.

An anecdote about Messier shows his devotion to his hobby. Another French astronomer, Montaigne, also went in for comet hunting, and there was a keen rivalry between the two men. After Messier had discovered twelve comets, his wife was taken sick and finally died. While attending her, another comet appeared, which was missed by him, but found by Montaigne. After his wife's death, a friend condoled with Messier about his loss. "Alas," exclaimed Messier, "Montaigne has robbed me of my thirteenth comet." Then he realized that he should be mourning his wife, and so added as an afterthought, "Ah, poor woman!"

Later, however, he did find still another comet, so that he attained his thirteenth.

(Just turn the page)



HOLD THESE MAPS IN FRONT OF YOU and face north or south. The upper or lower map then shows the February night sky as it appears to you

Record Comet Discoveries

(Continued from page 67)

One of the comets that has appeared recently bears the name of another famous amateur. The Pons-Winnecke comet, which appeared to the naked eye last summer, was first discovered by Pons, early in the nineteenth century. Pons was a doorkeeper at the Marseilles Observatory, and encouraged in his hobby by the director.

Radio Saves Comets

Just as important in keeping track of comets as modern telescopes are modern means of communication. Cable, telegraph and radio have saved many a comet from possible loss. One observation of a comet, continued for perhaps an hour or so, will reveal its cometary character. But that will not tell just how it is moving. In order to determine its orbit, three different observations, at different times, are needed. In the old days, a comet might be observed by one astronomer, and then a period of cloudy weather might ensue, during which the comet would be invisible to him. Then, when it cleared again, the comet might have moved out of sight altogether or at least to a very different part of the sky.

Now, this can hardly happen. Take the example of the Skjellerup comet for instance. On December 3, this Australian amateur found the comet. Using a special code for the purpose, he immediately cabled to the Central Astronomical Bureau at Copenhagen, Denmark, which is under the direction of Prof. Elis Stromgren. From Copenhagen the news was cabled over to the United States, as well as to observatories in Europe. It was received at the Harvard College Observatory, the American clearing house, and telegraphed to

American and Canadian observatories the day after discovery. This was in code, and looked like this:

SKJELLERUP COMET UXFI-
BADEUX FIIPDEOTDE BAAM-
BADEBA DEVYBAKUFI KUIPV-
VYVFI FIFIAMIPOT.

To the astronomer receiving this mysterious looking wire it conveys the information that Skjellerup has discovered a comet of the third magnitude on December 3.7292 (the time being given in decimal fractions of a day rather than hours, minutes and seconds), and that it was then at 16 hours 12 minutes and 12 seconds right ascension and minus 53 degrees 57 minutes declination. These are the celestial equivalents of latitude and longitude. As soon as an astronomer gets one of these wires he knows where to look for the comet, and so, as the discovery can be broadcast to the whole world in a few hours, some place is almost certain to have clear weather and to observe it.

Three Observations Needed

Then, when the necessary three observations have been made, the exact orbit can be computed, and astronomers can tell how it is moving. At many different observatories orbit computations are made. The first one to be calculated for Skjellerup was done by Dr. H. E. Wood, of the Union Observatory, at Johannesburg, South Africa. In the United States, the chief work of orbit computing is done by graduate students at the University of California, under the direction of Prof. Armin O. Leuschner.

Orbit computing is rather a complicated problem, but an expert at it can sometimes turn out one in a few hours after he has received the three positions. The method was invented by the great German astronomer, Gauss, and, curiously enough, was made to order, to keep track of a tiny planet, or asteroid. On January 1, 1801, the Italian astronomer Piazzi found Ceres, the first of these numerous bodies to be discovered. He observed it until February 11, when he was taken sick, and could no longer watch it. Then the little planet came near the sun, and so could not be seen at all. The methods of orbit computation then in use were not able to tell the orbit of the comet, so Gauss set to work to invent a new method of computing orbits, with very few positions, and to calculate the orbit of Ceres in time to find it again when it had passed the sun.

Seemingly an impossible task, Gauss actually succeeded in his problem, and he predicted the position so accurately that Ceres was again picked up in November, 1801, and has been kept track of ever since. This is essentially the same method now used for comets.

Comets "Airy Nothings"

Impressive as some of the comets become, they are really very small, in mass. In order to allay fears when one comet approached near the earth, an astronomer announced that it could be packed up in a trunk, so rarefied was it. While this is not quite literally true, it gives an idea of the nature of a comet. Though sometimes millions of miles long, the biggest are probably no more massive than a smaller example of the tiny planets. Even when the head, presumably the densest part of a comet, passes in front of a faint star, the star shines through with practically undiminished light. The tail is so imponderable that it is pushed aside by the light from the sun, and therefore always points away from it. When the comet approaches the sun, the tail is behind, when it leaves, the tail precedes.

This month of February is rather lean for striking astronomical phenomena, but the winter skies are now beginning to give way to those of spring. The map shows the stars as they appear this month. The "Sickle" of Leo, the lion, with the bright Regulus at the end of the handle, shines in the east, while Sirius, the Dog-Star, is now high in the southern sky. This is the brightest of all the stars in the sky. The Great Square of Pegasus has now moved to the west, where it will soon disappear below the horizon.

Jupiter is the only planet left in the evening sky. Even it is not visible through the entire evening, as it sets about three hours after the sun. Its brilliance in the southwest leaves no doubt as to its identity. In the early morning sky, just before day-break, three other planets can be seen. Venus is the brightest of this trio, while nearby are Mars and Saturn.

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Nearly 40 per cent. of all motor accidents occur at night, a safety expert declares.

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ZOOLOGY

Game Important Industry

Run your game animals and your livestock the same way. This is the advice given to New Mexico sportsmen and ranchers by J. Stokley Ligon of the U. S. Biological Survey. The once abundant wild life of the Southwest can be restored on the same basis as the deflated cattle industry by scientific range management and control of predatory animals, Mr. Ligon contends in his report on the wild life of New Mexico recently published by the state game commission.

"As an asset to the Southwest, wild life in the future can be made equal to a stabilized livestock industry," said Mr. Ligon. "It is one of the most valuable crops that can be produced; yet it has and continues to be the most recklessly abused. For the same reason that the Southwest is the leading year-round open range cattle and sheep country in the land, it is one of the best year-round game sections. The varying topography of the state ranging from plains at less than 3,000 feet to mountain peaks at 13,600 feet results in the widespread distribution of more than fifteen distinctive game animals, ten species of resident land game birds, the many species of fish and a great variety of non-game birds."

It is man's domestic animals rather than his shot-gun which have nearly exterminated the native wild life in the Southwest, says Mr. Ligon. In the early days of free range the country was so heavily overstocked with cattle that the forage was badly depleted. This resulted in starvation for the game animals and birds and loss of the protective shelter of browse. While the stock suffered as much in a few years by these methods as the wild animals, the latter were able to find natural refuges in the rugged mountainous areas into which the stock could not penetrate. For this reason big game is still found all over the state except in the Navajo country which was completely hunted out before state game laws became effective. Deer, turkey and quail are now the principal residence game. Mr. Ligon recommends the restocking of depleted areas with native game, reintroducing such exterminated species as buffalo, elk and sage grouse, the establishment of refuges and the enforcement of strict game laws.

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PHYSICS

A Non-Magnetic Sailor



JAMES P. AULT

Until he was twenty-four, Captain Ault had never seen the ocean. But since then, he has been making up for lost time. By 1931, when he will return from his next cruise, he will just have passed the half century mark, and he will have sailed one of the strangest ships afloat more than 200,000 miles through all the seven seas!

Captain Ault is the commander of the Carnegie Institution's non-magnetic ship, "Carnegie." This is the boat that was made with a minimum of iron in its hull and fittings, so that it could make accurate measurements of the earth's magnetism in all parts of the world. In May, when it again sails down the Potomac on the start of a three-year cruise under Captain Ault's command, it will carry in its scientific staff not only magnetic experts, but biologists as well, for the next expedition will be the most ambitious yet. On this trip, Captain Ault will find his time full enough, for not only does he navigate the ship and command the crew, but he also personally directs and takes part in the scientific observations, and the computations that are made right on shipboard.

Olathe, Kansas, claims him as a native, and Baker University, at Baldwin, Kansas, is his *alma mater*. In 1905 he made his first ocean trip on the Survey ship "Bache." With one brief exception, while war work claimed his attention, Captain Ault has commanded this ship since its third voyage began in 1914.

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ANTHROPOLOGY

India Has "Sin-Goat"

The ancient Hebrew custom of loading the sins of the people on a scape-goat, which bore them off into the wilderness, has a modern parallel in a certain district in central India. It is not sins, however, which the modern scape-goat is required to carry off, but smallpox.

When an outbreak of smallpox occurs in a village, the inhabitants resort to the ceremony of "Nikasi." A female goat is purchased by public subscription, and is adorned with the particular types of ornaments usually affixed to the image of a goddess. The goat is then apparently looked upon as an incarnation of the goddess of the disease. The animal is supposed to remove the epidemic as she is passed on from village to village until she reaches her own temple, or is devoured by wild beasts on the way.

Science News-Letter, February 4, 1928

MEDICINE

Plane Ride Cures Disease

Commercial aeroplane companies will probably be besieged with juvenile passengers if latest reports from Germany are confirmed.

A Charlottenburg aeroplane owner, according to the German correspondent of the British medical journal, *Lancet*, recently had occasion to take his two young daughters on a short trip by air while they were suffering from whooping cough. After the journey the children's coughing fits were so alleviated that the physician in attendance advised the father to take the girls up with him again. Within a short time they were completely cured, whereas the baby left behind on the expeditions into higher regions ran the full harrowing whooping cough course.

The children remained in the air about an hour each time and reached altitudes as high as 10,000 feet. It has been suggested that aeroplane companies place planes at the disposal of health authorities for experiment on a larger scale with this unexpected light on a vexing problem. Change of climate is known to be the best remedy for whooping cough, consequently it may sometimes be cheaper, it is pointed out, to have the small patients travel in an aeroplane than to have them spend weeks at the mountains or seaside.

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SCIENCE SERVICE
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Classics of Science:

Cartesian Co-ordinates

Suggested by Dr. Mark H. Liddell

In the extract here quoted, Descartes laid the foundation of analytic geometry. It will be observed that he chose for reference a vertical instead of a horizontal line, that he calls the "origin" A instead of O, and that his ordinates and abscissas seem reversed to those used to the modern designations, but aside from these minor points the derivation of his equation of the curve is essentially the same process that the student might use today, should he wish to show his prowess on such a complicated case.

THE GEOMETRY OF RENE DESCARTES, translated from the French and Latin by David Eugene Smith and Marcia L. Latham with a facsimile of the first edition, 1637. Chicago, 1925.

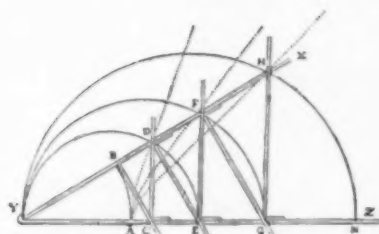
Complex Curves

Consider the lines AB, AD, AF and so forth, which we may suppose to be described by means of the instrument YZ. This instrument consists of several rulers hinged together in such a way that YZ being placed along the line AN the angle XYZ can be increased or decreased in size, and when its sides are together the points B, C, D, E, F, G, H, all coincide with A; but as the size of the angle is increased, the ruler BC, fastened at right angles to XY at the point B, pushes toward Z the ruler CD which slides along YZ always at right angles. In like manner, CD pushes DE which slides along YX always parallel to BC; DE pushes EF; EF pushes FG; FG pushes GH, and so on. Thus we may imagine an infinity of rulers, each pushing another, half of them making equal angles with YX and the rest with YZ.

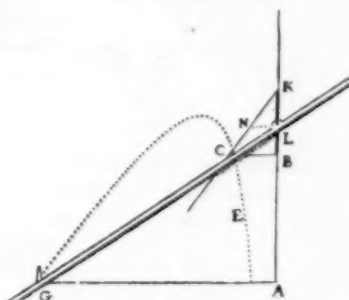
Now as the angle XYZ is increased the point B describes the curve AB, which is a circle; while the intersections of the other rulers, namely, the points D, F, H describe other curves, AD, AF, AH, of which the latter are more complex than the first and this more complex than the circle. Nevertheless I see no reason why the description of the first cannot be conceived as clearly and distinctly as that of the circle, or at least as that of the conic sections; or why that of the second, third, or any other that can be thus described, cannot be as clearly conceived of as the first; and therefore I see no reason why they should not be used in the same way in the solution of geometric problems.

Relation to a Straight Line

I could give here several other ways of tracing and conceiving a series of curved lines, each curve more complex than any preceding



Descartes' curves drawn by his hinged instrument



Descartes' drawing of the hyperbola referred to his co-ordinates

one, but I think the best way to group together all such curves and then classify them in order, is by recognizing the fact that all points of those curves which we may call "geometric," that is, those which admit of precise and exact measurement, must bear a definite relation to all points of a straight line, and that this relation must be expressed by means of a single equation. If this equation contains no term of higher degree than the rectangle of two unknown quantities, or the square of one, the curve belongs to the first and simplest class, which contains only the circle, the parabola, the hyperbola, and the ellipse; but when the equation contains one or more terms of the third or fourth degree in one or both of the two unknown quantities (for it requires two unknown quantities to express the relation between two points) the curve belongs to the second class; and if the equation contains a term of the fifth or sixth degree in either or both of the unknown quantities the curve belongs to the third class, and so on indefinitely.

Line of Reference

Suppose the curve EC to be described by the intersection of the ruler GL and the rectilinear plane figure CNKL, whose side KN is produced indefinitely in the direction of C, and

(Just turn the page)

Thermometer Runs Clock

A self-winding clock, run by what is virtually a glycerine thermometer, has been invented by a Swiss engineer, Karl Heinrich Meier. It utilizes the energy captured by the daily fluctuations in temperature to raise the weights that drive its mechanism, and it is stated that one of the clocks has been kept going for a year on a daily range of not more than eight degrees Fahrenheit. The essential mechanism consists of a long coiled tube filled with glycerine, connected with a cylinder, into which a piston is fitted. When the glycerine is warmed and expands, it forces out the piston which, in turn, lifts the clock weight. It is expected that this device will be especially useful in operating outdoor clocks in public places. The types now in common use are usually electrically driven and are therefore expensive to install, besides requiring frequent attention.

Science News-Letter, February 4, 1928

ENGINEERING

Engine May Save Millions

American automobile owners can save \$400,000,000 annually by using engines that operate at a constant instead of a variable pressure, Prof. H. M. Jacklin of Purdue University has reported to the Society of Automotive Engineers.

Present auto engines operate so that the volume of the gaseous fuel exploded is constant. Prof. Jacklin's experiments were made upon an experimental engine constructed with a movable cylinder-head that was used to reduce the volume of the cylinder as the speed of the engine decreases. This maintained the same pressure within the cylinder at all speeds. No adjustment of spark was necessary.

Gains of up to 50 per cent. in miles per gallon might be expected if the new type engine were substituted for the ordinary engine now in use. Fuel bills would be cut a third, according to Prof. Jacklin's computations. Assuming a complete substitution of the constant compression engine in the 20,000,000 cars now running 6,000 miles a year on 20 cents per gallon gasoline, Prof. Jacklin sees the possibility of conserving our natural resources and the national pocketbook to the extent of some four hundred millions annually.

Science News-Letter, February 4, 1928

The Arctic tern migrates from the north polar regions to the Antarctic.

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Cartesian Co-ordinates

(Continued from page 71)

which, being moved in the same plane in such a way that its side KL always coincides with some part of the line BA (produced in both directions), imparts to the ruler GL a rotary motion about G (the ruler being hinged to the figure CNKL at L). If I wish to find out to what class this curve belongs, I choose a straight line, as AB, to which to refer all its points, and in AB I choose a point A at which to begin the investigation. I say "choose this and that," because we are free to choose what we will, for, while it is necessary to use care in the choice in order to make the equation as short and simple as possible, yet no matter what line I should take instead of AB the curve would always prove to be of the same class, a fact easily demonstrated.

Finding the Equation

Then I take on the curve an arbitrary point, as C, at which we will suppose the instrument applied to describe the curve. Then I draw through C the line CB parallel to GA. Since CB and BA are unknown and indeterminate quantities, I shall call one of them y and the other x . To the relation between these quantities I must consider also the known quantities which determine the description of the curve, as GA, which I shall call a ; KL, which I shall call b ; and NL parallel to GA, which I shall call c . Then I say that as NL is to LK, or as c is to b , so CB, or y , is to BK, which is therefore equal to

$$\frac{b}{c}y.$$

Then BL is equal to $\frac{b}{c}y - b$, and

AL is equal to $x + \frac{b}{c}y - b$. Moreover,

as CB is to LB, that is, as y is to $\frac{b}{c}y - b$, so AG or a is to LA or

$x + \frac{b}{c}y - b$. Multiplying the second

by the third, we get $\frac{ab}{c}y - ab$ equal

to $xy + \frac{b}{c}y^2 - by$, which is obtained

by multiplying the first by the last. Therefore, the required equation is

$$y^2 = cy - \frac{cx}{b}y + ay - ac.$$

Rene Descartes was born in the province of Touraine, France, March 31, 1596, and died in Stockholm, February 11, 1650. He attended school at La Fleche from the age of eight to the age of sixteen, and then went to Paris to live as his own master. There he enjoyed the friendship of Claude Mydorge, famous mathematician, and Marin Mersenne, a member of the order of Minim friars, which lasted until the death of those friends about 1648. After alternately tasting the pleasures of Paris social life and studying mathematics in strict seclusion, Descartes emigrated to the Netherlands, then a refuge for intellectuals who had run afoul of the political and religious intrigues of their native countries. He enlisted in the army of the Prince of Orange, and spent the years 1617 to 1621 in one army or another in various parts of Europe. It was in 1619 that he worked out his mathematical ideas later published as the Discourse of Method, from which the above translation was made. In 1625 Descartes settled in Paris, but 1629 found him back in Holland, where he continued to live, though in thirteen different towns, until a year before his death. During this later residence in Holland, he abandoned mathematics for the study of physics and physiology.

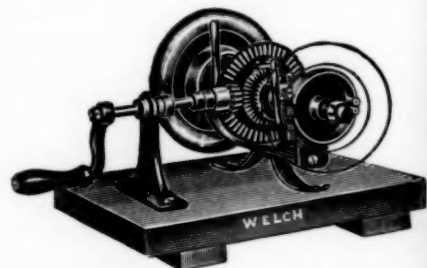
Science News-Letter, February 4, 1928

Polar seas are bright green in color.

New York City spends over \$3,000,000 a year removing snow from its streets.

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New Ideas of Clothing

(Continued from page 66)

skirt would not have won so easily if the defeated majority had not been allowed to compensate for this loss by a facial gain."

Among the effective "union weapons" which women of average and less than average attractiveness have forced into fashion to level feminine charm he cites the parasol and fan, plucking of eyebrows, henna, hoops and bustles, gloves, and corsets. And among the men natural defects and advantages have been leveled by coats which hide feeble biceps, trousers which conceal unathletic legs, and beards, which in other decades have served as a camouflage of features good or otherwise.

The energy in the attack of the one-piece bathing suit was supplied by women who had good reason to distrust their ratings in a bathing beauty contest, the psychologist points out, even though the attack on bathing costumes may have been headed by male moralists.

The question of modesty, which is so often dragged into discussions of dress and which is used as the basis of attack by clothes reformers of every age really has little to do with the case, Dr. Dunlap shows:

"The falsity of the theory that clothing is modest should have been evident long ago from the fact that oriental women have had to conceal their faces to be modest, while western women have not been under similar necessity; and the fact that naked savages are often more modest than clothed Europeans.

"The Greek girl cast off her garments in public when they became inconvenient. Modesty of clothing seems to have appeared only when, through the invention of elaborate and costly materials and expensive dyes, it became possible to display one's wealth and indicate one's social position by the mere quantity of valuable clothing worn. Then began the practice of completely enveloping the person in expensive cloths, laces, velvets, feathers, and gold work. That women are as modest now in knee length skimpiness as they ever were in hoop skirts or in sidewalk sweepers, should be apparent even to those whose knowledge extends no farther than their village boundaries.

"Any degree of clothing, including complete nudity, is perfectly modest as soon as we become thoroughly accustomed to it. Conversely, any change in clothing suddenly effected, may be immodest if it is of such a nature as to be conspicuous. This is

particularly true for men of limited intelligence and low education. The more highly cultured and educated individuals adjust themselves to new conditions with less shock.

"Clothing itself has no modesty or immodesty. It is merely the breaking of the established convention which makes it immodest."

So far as modern clothes go, Dr. Dunlap believes that people in civilized countries today are over-dressed rather than under-dressed. We wear too much clothing and the wrong kinds of clothing. And women, who have for so many centuries been the worst offenders in the matter of making racks of themselves on which to hang yards of silks and velvets, are now outstripping the men both literally and in the line of progress.

In this respect of clothes the savages have been wiser than civilized man, for they wore just enough clothing to serve as protection, and the kind of clothing they made for themselves was extremely practical. Reasoning along this line, this psychologist has come to a conclusion as to why primitive people first put on clothing.

This question of the origin of clothes has puzzled anthropologists considerably. Three solutions have been advanced, and each one has its advocates. One suggestion is that men and women began wearing clothes because they wanted protection from the cold. The second is that clothing was invented to make a man or woman more attractive to the opposite sex. The third is that at some stage of his development man began to feel that not wearing clothes was immodest.

Dr. Dunlap believes that clothing was invented for a very simple and heretofore unrecognized reason. The first clothes, he says, were flychasers, just like the fly nets with flapping tassels put on horses in the days of buggy riding, and just like the bunch of flapping leaves fastened behind the ears of the dray horse.

The fact that flapping, rustling things keep insects from settling down to sting and bite was a great discovery made by our ancestors thousands of years ago, according to this theory, and they must have discovered it through urgent necessity, for insects were their closest and most numerous enemies. None of our modern equipment of screens and fly paper, poisons and sanitary devices was available for warfare against insect pests. Primitive men had to meet the flea, fly, mosquito, cootie, and ant problem by keeping the creatures on the move. Hence the evolution of the grass skirt,

which rustles effectively; also the belt made of tails of animals dangling from the waist, strips of hide, and hanging strings. These light-weight garments are still seen among savages of the warm regions of the earth, which are just the localities where our prehistoric ancestors are believed to have developed their human traits.

African tribes today grease themselves and grease their skin cloaks to protect themselves from pests. They even move out of their huts after a time and build new ones to escape the increasing swarms of creatures that insist on living with them. But all this is not enough, and so they fall back on typical fly chasing garments as their best defensive armor.

There are other minor factors that figure in the origin of certain kinds of clothing, the psychologist adds. Thorns and other jungle annoyances led to the use of sandals, leggings, and arm protectors. But the whole clothes list of primitive men and women is practical in its origin, and its chief use was as a protection, not from cold as has been previously declared, but from small and tantalizing irritations.

Even ornaments, which must be accounted for in a separate and distinct manner, were highly practical when first worn, according to this theory. Ornaments were first worn as badges to show the wearer's status in society, so that as the savage walked about, his neighbors could look at him and know just how important he was. This same use of badges to indicate social standing is still widespread among savages.

"The expert can tell at a glance," says Dr. Dunlap, "from the earrings, nose rings, haircut, headdress, tattoos, scars, and other badges of the savage in full regalia, to what tribe the savage belongs, whether he is a warrior or counselor, whether married, and if so the number of his wives, how many sons he has and whether these are warriors or not, how many cows he owns, and so on throughout the savage's complete Bradstreet and social register."

From that stage, ornaments have come to be worn largely as a matter of habit. The useful beads and other decorations later become desirable as pure ornaments. High heeled shoes, originally the badge of the lady, indicating that she did not work, became "stylish" and working women today teeter around in them because of this earlier prestige of high heels.

Until the days of machine-made clothing, many points about an in-

(Just turn the page)

New Ideas of Clothing

(Continued from page 73)

dividual's costume were badges of social status. In very recent centuries, high caste women wore skirts so heavy and clumsy that they had to be supported by attendants when they appeared in a court ball room. They wore their hair dressed in such extravagance that any one would know that much time and money had been expended on a coiffure. But now, the shop girl and the stenographer can wear the same, or apparently the same, fabrics in the same colors and made by the same patterns as the daughter of the oil king.

Clothes have lost most of their usefulness as badges of social rank. And, as has already been mentioned, clothing is not important as a protection most of the time in the countries where civilization is advanced. Dr. Dunlap believes that man could profit by reducing his winter attire as woman has reduced hers, and that in warm weather both sexes would be better off hygienically if they completely discarded clothing the greater part of the time.

But so long as the drama of sex rivalry goes on, with attractive individuals favoring scanty dress and unattractive individuals favoring heavy camouflage, the tide of dress is as likely to turn one way as the other.

The fact that makes it likely that costumes will become more scant rather than more voluminous is that the value of sunlight has begun to be stressed. Babies of all classes are now dressed or rather undressed, so that they can get sun baths, instead of being swathed in clothes, as well dressed babies of other periods have been. It has been realized very lately that children of kindergarten age, and those younger and older too, are not being dressed so as to get the benefit of the valuable ultra-violet rays when they play out of doors, for these rays do not go through thick clothing. Because of this, government home economics specialists have begun to study the kind of clothes that will meet this need, particularly summer clothes for children.

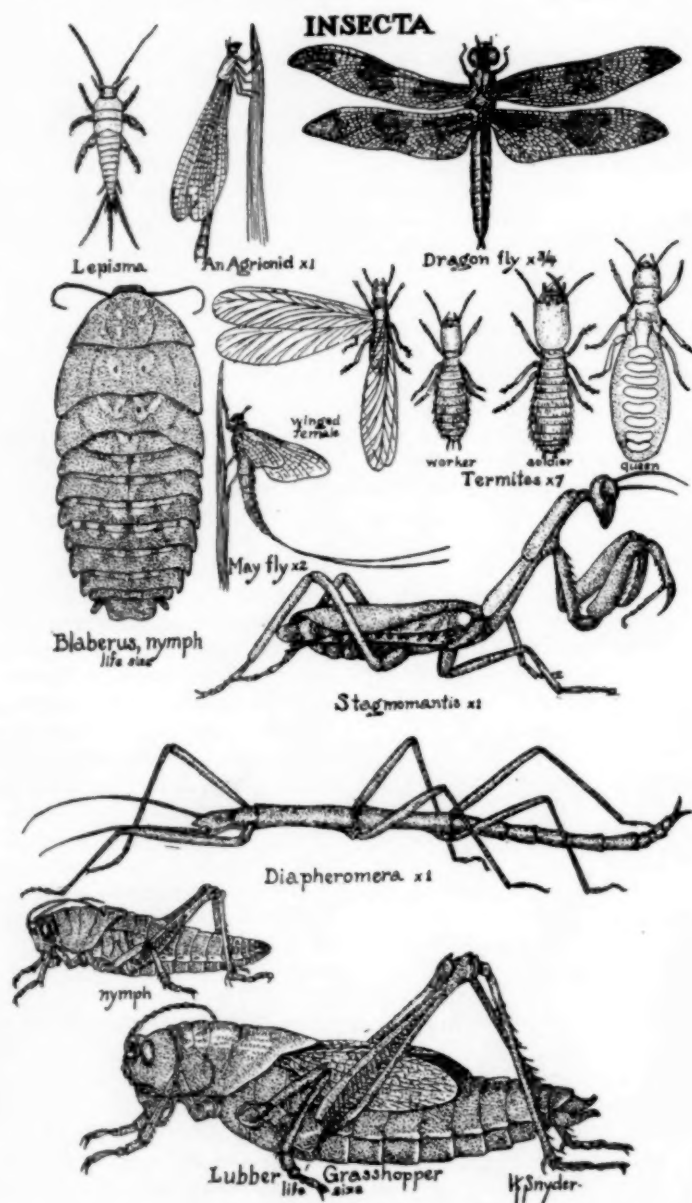
So gradually, the idea may work upwards toward the adult, and the urge to get a daily dose of sunshine will seize the average man and woman acutely enough so that he and she will demand clothes suitable for the new idea. The one piece bathing suit, so long denounced as unsuitable for civilized human beings, may yet become the respectable attire of another generation.

Science News-Letter, February 4, 1928

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BIOLOGY

NATURE RAMBLINGS

By FRANK THONE



III Repute Unearned

It will be several weeks yet before the spring poets unlimber their lyres and begin to sing the praises of crocuses and hepaticas and modest, shy violets. But already a sturdy flower of spring is beginning to defy a frosty and unfriendly world, wherever the flat floor of a swamp or bog gives space enough for its rather expansive temperament. Right along with the alders, earlier than the pussy-willows, offering competition to that strange winter-flowering shrub the witch-hazel, the skunk cabbage comes into bloom.

It does not even wait for the ice to disappear from its watery habitat. You can find skunk cabbages determinedly pushing plates of ice away, and unfolding their grotesque flower-sheaths through the holes they have made for themselves, with the thin sheets of frozen water leaning edge-wise against them. If a thaw lets these plants get started a subsequent freeze is of no avail; they keep right on coming in spite of it. It would take a genuine cold wave, driving the frost deep into the ground again, to stop them.

There is no real need for the spring poets to turn up their noses so superciliously at the skunk cabbage. It offends nobody's nostrils unless it is trodden on or otherwise abused—and who wouldn't fight back then? In this it is like its malodorous animal namesake; for the skunk also does no offense unless he is offended against.

The skunk is a most unfortunate gentleman. He is a really handsome animal, good-natured and courteous withal, and given to minding his own business. But because of his unfortunate choice of a weapon wherewith to defend himself against his enemies, he has become a cause for nipping the nose—as a joke not quite in good taste, or more accurately perhaps a joke not in good odor.

Yet he deserves better at our hands. He really uses his weapon very rarely

(Just turn the page)

AVIATION

Slot Increases Plane Safety

The new automatic slotted wings for airplanes, invented in England and now being given their first American trials on Navy planes, will reduce the aviation death lists considerably if their performance in practice lives up to their showing in tests.

More than 80 per cent. of the fatal accidents in aviation are due to stalling, spinning and nose-diving. The automatic slots attached to an airplane cure the stall and tend to make the airplane safe.

"Stalling" is the nightmare of every pilot. Good ones or bad may stall their craft when they try to land too slowly, climb too quickly, or land a plane with a dead engine. When the flying speed of the plane reduces to a certain point, the "lift," or supporting force on the wings caused by the rush of the plane through the air, decreases. The plane then tends to slip backward, as it were, and the pilot can not make it obey the ailerons or other controls. It spins and plunges downward toward earth. If the pilot knows enough and is high enough when a stall occurs, he can eventually right and save his ship. But if the altitude is low or the pilot unskilled, a crash is practically sure to follow.

The Handley Page automatic slotted wings come into action when the plane is about to stall and become uncontrollable. They consist of slats or flaps on the front edge of the wings that, when the plane is flying normally, form a part of the wing structure. When the wing loses lift, however, the slat opens under the lifting force of the air on the slat itself. A slot is created on the wing and this so changes the characteristics of the airplane wing that it keeps the plane under control and prevents it from getting into a spin. Even an incompetent pilot can not stall his plane, according to claims made for the new device.

Slotted wings have been known for about ten years. Manually operated types were developed in England by the Royal Air Force and in Germany but these had the disadvantage of needing action on the part of the pilot to put them in operation. The Handley Page automatic slots were developed secretly in England and have only had limited demonstration there.

The plane that has just been demonstrated in Washington is so far the only one in America to be so

(Just turn the page)

ECOLOGY

Prairies May Stop Borer

The corn borer, which has swept over the northeastern states and during the past season made its first serious inroads into the great mid-western corn belt, may lose its terror as it spreads westward into the less humid prairie regions. Researches by Prof. E. N. Transeau and Prof. H. C. Sampson of the Ohio State University indicate that the pest tends to accumulate in really destructive numbers mainly in areas of naturally high soil and atmospheric moisture, and that its presence in drier places is less likely to be a serious matter.

Prof. Transeau's studies began in Ohio and Ontario, but were carried forward last summer by visits to the principal corn-raising regions of Europe, where the borer has been known for more than a century. In the analysis of the Ohio and Ontario data, it was discovered that the most serious borer infestation occurred in parts that were once covered by swamps and swamp forests. Fields that had been won from the former beech forests were also infested, but less seriously, and the areas that got off most easily were those that had once been covered by oak-hickory timber. The significant thing about this difference, Prof. Transeau points out, is that the beech forest was a formation of relatively moist lands, whereas the oak-hickory was a dry type of forest.

In Europe, the Ohio botanist found that conditions bore out his preliminary observations in this country. The heaviest infestations were found in what were once swamp forest regions, while corn growing in drier and better drained hilly areas was

(Just turn the page)

ARCHAEOLOGY

New Aztec Idol Found

A new "Chacmool", famous reclining Aztec or Maya god, whose cult was spread from Yucatan to Mexico and Central America in pre-hispanic times, has been discovered in Yucatan.

This stone god was found in the debris in one of the back rooms of the Temple of Warriors, one of the most famous of all Maya buildings in Yucatan.

Other "Chacmools" have been found in Tlaxcala, the Valley of Mexico, Michoacan, the archaeological city of Cempoala in the state of Vera Cruz, and as far south as the republic of Salvador in Central Amer-

(Just turn the page)

Prairies May Stop Borer

(Continued from page 75)

much less troubled. In particular, he found that the great corn-growing areas of Rumania and southern Russia, which are naturally open grasslands instead of forests, are not greatly troubled by the borers, in spite of the fact that the farmers of these countries probably take fewer clean-up precautions than do the corn growers of any other part of Europe.

Since the richest part of the American corn belt, reaching from central Illinois across Iowa into Nebraska, was originally a grassland, it is hoped conditions here will be as unfavorable to the borer and as favorable to the corn as those of European grasslands seem to be. It is true that the situation is not exactly parallel, for the long-grass prairies of Illinois and Iowa have no counterpart in southeastern Europe, whose grassy steppes are more like the mixed prairie and short-grass plains of Nebraska and Kansas. The long-grass prairies in part originated from sloughs and swamps, and in part developed on well drained uplands. The swamp prairie lands appear to be favorable to the corn borer. The upland long-grass prairies on the other hand fit into the series between the oak-hickory forest and the short-grass steppes or plains; and the relatively slight borer infestation of both regions gives rise to the hope that when the pest finally reaches the heart of the corn belt it will not everywhere have the disastrous effects on the principal American grain crop that were at first feared from its behavior in the vicinity of Lake Erie.

Science News-Letter, February 4, 1928

New Aztec Idol

(Continued from page 75)

ica. In the Maya area, the idol has been found solely in Chichen Itza, which points to the probability that he was an Aztec god with wandering habits.

The Chacmool just found in Yucatan differs in details from other monoliths also called by this arbitrary name, according to Inspector Eduardo Martinez Canton who represents the Mexican Department of Archaeology in Yucatan during the excavation season. The headgear of the idol forms a frog, and he wears several other curious ornaments which his other namesakes lack. But he is nevertheless a true Chacmool, an enigmatic god whose real business in prehispanic America has never been determined by archaeologists.

Science News-Letter, February 4, 1928

Slot Increases Plane Safety

(Continued from page 75)

equipped. It is an American-made NY training plane, as designated by the government, and equipped with pontoons to take off and alight on the water. However, the slotted wing is equally efficacious on land and sea planes and on monoplanes and biplanes.

According to naval officials, various other types of planes will shortly be equipped with the device so that its performance can be thoroughly investigated. The arrangements made with the Handley Page Company are only for the use of the slotted wing for service planes, in the army and navy. Commercial airplane manufacturers will have to secure licenses to use it directly from the British company, but since the safety of the planes is so greatly increased, experts express the opinion that in a few years commercial planes will be equipped with the slotted wing.

Science News-Letter, February 4, 1928

Do You Know That—

Pythagorean philosophers of 2,500 years ago began to suspect that the earth was not the center of the universe.

Since farm horses are being replaced by machinery it may become necessary to make artificial manure from crop refuse.

Rare fossil fish at least 500 million years old have been collected in New York State for the Field Museum in Chicago.

Under favorable conditions, ship boring worms may grow to be six feet long, but ordinarily their growth is stunted at a few inches.

An electric power shovel about to be built will scoop up enough dirt to fill a small room at one bite, and will be "the world's largest."

The Chinese knew about cotton as early as the sixth century A. D., but they depended on outside sources for it until the twelfth century.

Operating rooms in a San Francisco hospital have green walls, which are said to be more restful to the eyes of the surgeon than white.

Nature Ramblings

(Continued from page 75)



and only under provocation—like a gentleman sheriff of the older West. Except at such times the skunk has no odor at all, and thereby he is really at an advantage over his relatives the weasels, minks, etc., for these animals, though they have a much fainter odor, make use of it much more freely.

The possession of such a powerful means of defense has made the skunk very bold and indifferent to dangers which his relatives use all their agility and speed to avoid. It is proverbially impossible to catch a weasel asleep, but a skunk doesn't care whether you catch him asleep or not; he knows you will let him alone in any case. It is also a notable thing that the only animals of the weasel tribe ever run over by automobiles and railroad trains are skunks. These little animals have successfully stood their ground for centuries against grizzly bears and mountain lions, and they have not yet had time to learn how much more formidable are these noseless man-driven machines.

Another result of this same fearlessness has been the loss of the hunting agility still retained by his kindred. The skunk is slower moving, less athletic, soft-muscled, inclined to obesity. Unlike almost all the rest of his fellow-carnivores, he retires into a burrow when the cold weather comes, and sleeps the winter through, huddled in little communities of five or six.

Science News-Letter, February 4, 1928

The farthest south an iceberg has ever been seen in the Atlantic was 164 miles from Bermuda.

In the newly found code of the laws of the ancient Hittites there were penalties for stealing honey from the beehives.

A fourteen-hour working day under sunlight and artificial light is the maximum for efficiency in hens, poultry experts warn.

Broadcast Photos Latest Achievement

RADIO

In broadcasting photographs from Station WEAJ in New York and receiving them in a private home 25 miles away from the transmitting station, radio engineers have gone a step farther towards the day when broadcasting of pictures of events, as well as the events themselves, will be as common as broadcasting of music.

The sending apparatus developed by Dr. E. F. W. Alexanderson, of the General Electric Co., and used in the recent demonstration from WEAJ, is essentially similar to that used by the Bell Telephone Company in sending photographs across the country by telephone wires, as that used by the Radio Corporation of America in transmitting photographs across the ocean by radio, and as that invented by C. Francis Jenkins, of Washington, and used by the Navy Department to send weather maps to ships at sea. Another form of the same apparatus has been developed by *Radio Broadcast*, which recently conducted the first sending of photographs by radio for reception on a set that could be built at home.

In all of these methods, the heart is in the so-called photo-electric cell. This device takes a beam of light that falls on it, and converts it to electricity. It depends on the fact that when a film of metal, such as potassium or sodium, is illuminated, it gives off electrons. These are the tiny atoms of electricity, of which the atoms of matter are supposed to consist. Their motion inside the cell results in a minute electric current. Vacuum tubes like those in ordinary radio receivers can amplify this minute current millions of times, if necessary.

In the Alexanderson transmitter, the photograph to be sent is wrapped around a cylinder which revolves in the same way as the old-time cylindrical phonograph records. But instead of the needle and sound box of the phonograph, a lens focuses a spot of light from a tiny lamp on to the cylindrical picture. A toothed revolving disc breaks the reflected light up into a series of impulses bright or faint, depending on the brightness of the part of the picture illuminated at the time. These impulses of light fall on the photo-electric cell, which produces a varying electric current corresponding to the picture. This apparatus is connected to the radio transmitter replacing the microphone, and so the radio impulses go out from the

aerial, carrying the picture with them.

In the Bell transmitter, and certain others, a photographic negative is used instead of the print, and the light shines through it to the photo-electric cell.

In the device for receiving the picture any standard radio set can be used for converting the radio waves back to electrical impulses. But instead of feeding these impulses into a loud speaker to emerge as sound waves, they go to a box where they are amplified further. Then they go to a Moore neon lamp, a form of electric bulb in which the light is furnished by glowing neon gas, instead of a tungsten filament. Unlike the tungsten light, which takes a brief time to start glowing after the current is turned on, and which remains glowing for an instant after the current is off, the neon lamp goes on and off instantaneously. On account of this advantage it has been extensively used in phototelegraphy and television. Forms of it were employed in the Bell Laboratories system of television, demonstrated last April, and in Dr. Alexanderson's own television system, which had its public debut a few weeks ago.

In this way a beam of light is obtained from the neon lamp that varies as did the beam reflected from the cylindrical picture in the transmitter. This beam is focused on a sheet of sensitive photographic paper, which is wrapped around a cylinder revolving like the cylinder at the transmitter. Both cylinders slowly move in the direction of their length as they turn, covering the whole picture. About 90 seconds of broadcasting time is required for a 4½ by 8-inch picture. The photographic paper is taken from the receiving cylinder and developed in the same manner as any ordinary print, made from a snapshot negative. It is a facsimile of the original picture.

Other forms of apparatus for transmitting pictures by wire or radio have been demonstrated from time to time. Their chief differences are in the method of varying the light in the receiver. In the Bell apparatus, by which anyone with the price can wire a photograph in a few hours from New York to San Francisco, a "light valve" takes the place of the neon lamp. An electric bulb of the ordinary type provides the light, and its intensity is varied by the valve, which in turn varies according to the current reaching it from the distant transmitter. As a negative is em-

ployed in the Bell transmitter, the light in the receiver shines on a photographic film, instead of a sheet of photographic paper, wrapped around the cylinder. Thus a duplicate negative is obtained from which any number of prints can be made.

The Cooley "rayfoto" device, that was demonstrated at the recent New York radio show by *Radio Broadcast*, uses an electrical discharge playing directly on the sensitive paper to form the image. In the Radio Corporation's radiophoto system, the amount of ink sprayed pneumatically on ordinary paper is regulated by the incoming current.

Science News-Letter, February 4, 1928

PSYCHIATRY

Critics Praise Insane Art

Art critics of Paris are greatly excited by an exhibit of painting and sculpture by patients afflicted with mental disease, according to reports received by the American Medical Association from its French correspondent.

It is a difficult matter, apparently, to choose between the psychopathic art and the products of the ultramodern school, futurists, cubists and the like. Only the work of patients who were not artists before their admissions into institutions, it is stated, are included in the exhibition.

This does not necessarily mean that the ultramoderns, who paint voluntarily the impressions of the subconscious mind, are insane, in the opinion of Dr. August Marie, a well-known French expert on mental disease. Such artists contend that they give free reign to their emotions and depict their inmost dreams without the control of reason very much after the manner of spontaneous art of savage tribes and prehistoric races.

The insane merely describe the vagaries of their subconscious minds and hallucinations for the satisfaction they get out of it, it is believed. Most of them have no notion of technique yet one painted in quite unearthly colors, roaring flames and waves of fire worthy of Turner. This picture was bought by a wallpaper manufacturer to serve as the basis of a new wallpaper design. A psychopathic priest depicted a pope blowing soap bubbles before an assemblage of swooning frogs.

The French expert believes that some of the paintings if removed from their environment and placed in the collections of a reputable dealer would command high prices, the medical correspondent declared.

Science News-Letter, February 4, 1928

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R	Medicine. General.
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SF	Animal culture. Veterinary medicine.
SH	Fish culture and fisheries.
SK	Hunting. Game protection.
T	Technology. General.
TA	Engineering. General.
TC	Hydraulic engineering.
TD	Sanitary and municipal engineering.
TE	Roads and pavements.
TF	Railroads.
TG	Bridges and roofs.
TH	Building construction.
TJ	Mechanical engineering.
TK	Electrical engineering and industries.
TL	Motor vehicles. Cycles. Aeronautics.
TN	Mineral industries. Mining and Metallurgy.
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750	Painting
760	Engraving
770	Photography
780	Music
790	Amusement
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Science News-Letter, February 4, 1928

THE EVOLUTION OF SCIENTIFIC THOUGHT FROM NEWTON TO EINSTEIN—A. D'Abro—*Boni and Live-right*. An exhaustive discussion of the theory of relativity and related concepts, and the development which has led to them, but the lack of an index in a book of this sort is really inexcusable.

Science News-Letter, February 4, 1928

THE MECHANISM OF HOMOGENEOUS ORGANIC REACTIONS FROM THE PHYSICAL-CHEMICAL STANDPOINT—Francis Owen Rice—*Chemical Catalog* (\$5). The latest volume in the American Chemical Society's series of monographs.

Science News-Letter, February 4, 1928

INTENSIFICATION AND REDUCTION—E. J. Wall—*American Photographic Publishing Co.* (\$1). Even the best of photographers sometimes over-expose, or under-develop; and hence the need for such a book as this. Mr. Wall gives a résumé of old and new methods of reduction and intensification. His complete bibliography gives all the information needed by one who might wish to pursue the subject further.

Science News-Letter, February 4, 1928

THE EARTH AND ITS HISTORY—John Hodgdon Bradley—*Ginn* (\$3). Intended for elementary college courses, this new geology text covers the present state, as well as the evolution, of the earth. A chapter on "Geology in the Service of Man" will answer the student's question "What's the good of this?"

Science News-Letter, February 4, 1928

A TEXTBOOK OF BACTERIOLOGY AND ITS APPLICATIONS—Curtis M. Hilliard—*Ginn* (\$2.80). A compact text designed for beginning students in a general course.

Science News-Letter, February 4, 1928

TIMBUCTOO—Leland Hall—*Harper* (\$4). A map inside the front cover shows just where Timbuctoo is, the author's first chapter tells how he finally succeeded in getting there, with difficulties. And in the rest, he tells his fascinating story of what he found there.

Science News-Letter, February 4, 1928

ANIMAL MIND—Frances Pitt—*Stokes*. An interesting but rather bulky and not very well written collection of notes of the author's observations of animal mentality.

Science News-Letter, February 4, 1928

ANTHROPOLOGY A Theory of Woman's Sphere

THE MOTHERS by Robert Briffault. 3 vols. New York: The Macmillan Company. 1927. \$9.00.

"The Mothers" is a work of amazing erudition and range of research. There is nothing to compare with it in the field of anthropology unless it be "The Golden Bough" which Frazer began as a magazine article but found the subject expand as he studied it until he filled twelve big volumes. Mr. Briffault has written three volumes of 800 pages each and if he does not convince all his opponents he is likely to overwhelm them with the avalanche of evidence he has amassed. All anthropologists seem to be able to fish up any kind of cases they need to prove their theories from the same travelers' tales, but Mr. Briffault finds more than anybody else. On some pages there are only three lines of text at the top of the page, supported by a foundation of 47 lines of fine print giving citations from the sources in defense of his thesis.

Whether he has proved his points is a question that will have to be settled by the sociologists and it will doubtless take them years to come to a conclusion on his deductions, but there can be no question of the value of the work as a cyclopedia and bibliography of information on primitive and ancient life. It is only the serious student who will go through the book for it is naturally hard and unpleasant reading on account of its bulk, repetitions and repulsive details. It reminds one of the report submitted by the British Consul stationed in the Congo, who, when he came to the blank in his official form headed: "Manners and customs," filled it out conscientiously and correctly: "Manners, none; customs, nasty."

The author presents many iconoclastic views on the origin of society that run counter to current opinions. He contradicts Westernmarck's theory that monogamous marriage was common among primitive peoples, also the theory of McLennan and Lubbock as to the meaning of marriage by capture. He holds that the moon was superior and prior to the sun as an object of early adoration because the moon was the woman's god. He believes that in the primitive period woman was the dominant sex, the suitor in courtship, the sovereign of the home, the manager of industries and the leader in religious rites. A few paragraphs will give most clearly and correctly his theory of the course of history.

"So long as the men possessed no fundable wealth, marriage has tended to remain matri-local and the social order to retain consequently a matriarchal character, except where male dominance was established by brute-force in savage societies which have shown themselves incapable of further development. Definite economic power was first placed in the hands of men by the domestication of animals, which are always regarded as appertaining to the province of the hunter, and by the development of pastoral societies. That power has commonly been used to buy off the claims of women and of their families to the allegiance and services of husbands; women are purchased for cattle, and patriarchal society with patrilocal marriage becomes inevitably established among pastoral peoples."

"The regular and assured agricultural food-supply released the men; the cornfield abolished the economic importance of the hunter. The primitive economic function of the male came to an end. He was set free for other avocations. He had yoked his oxen to the plough; he had by degrees taken over the bulk of agricultural labour. The industries which had hitherto been almost exclusively in women's hands, passed into those of the men. The household crafts which had originated with the household work, pottery, woodwork, rude building, weaving, became masculine industries."

"The sexual division of labor upon which social development had been founded in primitive societies was abolished. Woman, instead of being the chief producer, became economically unproductive, destitute and dependent."

—E. E. Slosson.

Science News-Letter, February 4, 1928

THE WORLD MOVES SWIFTLY

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